

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

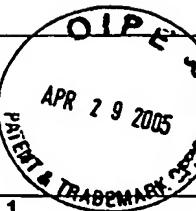
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Sheet

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of

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Application Number	10/698,170
Filing Date	October 30, 2003
First Named Inventor	Sei-Hyung Ryu
Group Art Unit	2811
Examiner Name	Tran, Long K.
Attorney Docket Number	5308-279

U.S. PATENTS AND PATENT PUBLICATIONS

Examiner Initials*	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code (if known)		
LT	1	6,303,508	B1	Alok	10/2001
	2	6,297,100	B1	Kumar et al.	10/2001
	3	6,133,587		Takeuchi et al.	10/2000
	4	6,025,233		Teresawa	02/2000
	5	6,020,600		Miyajima et al.	02/2000
	6	5,976,936		Miyajima et al.	11/1999
	7	5,917,203		Bhatnagar et al.	06/1999
	8	5,877,041		Fuller	03/1999
	9	5,851,908		Harris et al.	12/1998
	10	5,837,572		Gardner et al.	11/1998
	11	5,814,859		Ghezzo et al.	9/29/98
	12	5,804,483		Harris	09/1998
	13	5,734,180		Malhi	03/1998
	14	5,710,059		Rottner	01/1998
	15	5,510,281		Ghezzo et al.	4/23/96
	16	5,393,999		Malhi	02/1995
	17	5,384,270		Ueno	01/1995
	18	5,348,895		Smayling et al.	09/1994
LT	19	3,629,011		Tohi et al.	12/1971

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		Office	Number	Kind Code (if known)			
LT	20	WO	97/08754			03/1997	

OTHER NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T
LT	21	Palmour et al. "SiC Device Technology: Remaining Issues," Diamond and Related Materials. vol. 6, 1997, pp. 1400-1404.	
LT	22	Rao et al. "P-N Junction Formation in 6H-SiC by Acceptor Implantation into N-Type Substrate," Nuclear Instruments and Methods in Physics Research B. vol. 106, 1995, pp. 333-338.	
LT	23	Rao et al. "Al and N Ion Implantations in 6H-SiC," Silicon Carbide and Related Materials. 1995 Conf, Kyoto, Japan. Published 1996.	
LT	24	Capano, M.A., et al., Ionization Energies and Electron Mobilities in Phosphorus--and Nitrogen-Implanted 4H-Silicon Carbide, IEEE ICSCRM Conference 1999, Research Triangle Park, North Carolina (Oct. 10-13, 1999).	
LT	25	Patel, R., et al., Phosphorus-Implanted High-Voltage N.sup.+ P 4H-SiC Junction Rectifiers, Proceedings of 1998 International Symposium on Power Semiconductor Devices & ICs, pp. 387-390 (Kyoto).	
LT	26	Dastidar, Sujoyita, A Study of P-Type Activation in Silicon Carbide, Thesis (Purdue University, May 1998).	

Examiner Signature	/Long Tran/	Date Considered	05/05/2006
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		O P E MAR 17 2005 PATENT & TRADEMARK OFFICE		Application Number	10/698,170
(use as many sheets as necessary)				Filing Date	October 30, 2003
				First Named Inventor	Sei-Hyung Ryu
				Group Art Unit	2811
				Examiner Name	Tran, Long K.
Sheet	1	of	1	Attorney Docket Number	5308-279

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Examiner Initials*	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code (if known)		
LT	1.	US-6,759,684		Fukuda et al.	07-06-2004
	2.	US-6,653,659		Ryu et al.	11-25-2003
v	3.	US-6,573,534		Kumar et al.	06-03-2003
	4.	US-6,551,865		Kumar et al.	04-22-2003
	5.	US-6,448,160		Chang et al.	09-10-2002
	6.	US-6,420,225		Chang et al.	07-16-2002
	7.	US-6,399,996		Chang et al.	06-04-2002
	8.	US-6,180,958		Cooper, Jr.	01-30-2001
	9.	US-5,629,531		Palmour	05-13-1997
	10.	US-5,396,085		Baliga	03-07-1995
	11.	US-5,385,855		Brown et al.	01-31-1995
	12.	US-5,270,554		Palmour	12-14-1993
	13.	US-5,111,253		Korman et al.	05-05-1992
	14.	US-4,811,065		Cogan	03-07-1989
↓	15.	US-2004/0211980	A1	Ryu	10-28-2004
	16.	US-2004/0212011	A1	Ryu	10-28-2004
LT	17.	US-2002/0047125	A1	Fukuda et al.	04-25-2002

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OTHER NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T
LT	20.	United States Patent Application Serial No. 10/686,795, "Methods of Forming Power Semiconductor Devices Using Boule-Grown Silicon Carbide Drift Layers and Power Semiconductor Devices Formed Thereby," filed October 16, 2003 (Attorney Docket No. 5308-286).	

Examiner Signature	/Long Tran/	Date Considered	05/05/2006
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FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office				Attorney Docket Number: S308-279			Serial No.: 10/698,170
LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)				Applicants: Sei-Hyung Ryu			
				Filing Date: October 30, 2003			Group 2811
U. S. PATENT DOCUMENTS							
Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
LT	1.	6,204,135	03/20/2001	Peters et al.	438	301	
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FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
LT	2.	DE 198 32 329	2/4/1999	Germany	H01L	21/334	
LT	3.	WO 01/78134	10/18/2001	PCT	H01L	21/76	
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LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)				Applicants: Sei-Hyung Ryu			
				Filing Date: October 30, 2003			Group 281
U. S. PATENT DOCUMENTS							
Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
LT	1.	6,429,041	08/06/2002	Ryu et al.	438	105	
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FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
LT	2.	JP 03034466	02/14/1991	Japan			Abstract
LT	3.	JP 01117363	05/10/1989	Japan			Abstract
LT	4.	EP 1058317 A2	12/06/2000	EPO			
LT	5.	DE 19809554 A1	09/10/1998	Germany			
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
LT	6.	Copy of International Search Report for PCT/US03/38490 mailed 08/05/2004					
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U.S. Department of Commerce
Patent and Trademark Office

Attorney Docket No.
5308-279

Serial No.
10/698,170

Applicant: Sei-Hyung Ryu

Filing Date: October 30, 2003

GAU: 2811

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Examiner Initials		Document No.	Date (m/d/y)	Name	Class	Subclass	Filing Date if Appropriate
LT	1	6,610,366	8/26/03	Lipkin	427	378	4/12/01
	2	6,316,791	11/13/01	Schorner et al.	257	77	
	3	6,228,720	05/08/01	Kitabatake et al.	438	268	
	4	5,877,045	3/2/99	Kapoor	438	151	
	5	5,739,564	4/14/98	Kosa et al.	257	298	
	6	5,587,870	12/24/96	Anderson et al.	361	313	
	7	5,479,316	12/26/95	Smrtic et al.	361	322	
▼	8	2002/0102358	8/1/02	Das et al.	472	376.2	10/26/01
▼	9	2002/0030191	3/14/02	Das et al.	257	77	6/12/01
LT	10	2002/0038891	4/4/02	Ryu et al	257	350	6/24/01

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LT	11	WO99/63591	12/9/99	PCT			
LT	12	WO 98/02924	01/22/98	PCT			
LT	13	WO 00/13236	03/09/00	PCT			

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LT	14	Bhatnagar et al. "Comparison of 6H-SiC, 3C-SiC, and Si for Power Devices," <i>IEEE Transactions on Electron Devices</i> , Vol. 40, No. 3, March 1993, pp. 645-55.
	15	Baliga, Power Semiconductor Devices, Chapter 7, PWS Publishing, 1996
	16	United States Provisional Patent Application Serial No. 60/435,212
	17	United States Provisional Patent Application Serial No. 60/294,307
	18	United States Patent Application Serial No. 10/422,130
	19	Mutin, P. Herbert, "Control of the Composition and Structure of Silicon Oxycarbide and Oxynitride Glasses Derived from Polysiloxane Precursors," <i>Journal of Sol-Gel Science and Technology</i> . Vol. 14 (1999) pp. 27-38.
	20	del Prado et al. "Full Composition Range Silicon Oxynitride Films Deposited by ECR-PECVD at Room Temperatures," <i>Thin Solid Films</i> . Vol. 343-344 (1999) p. 437-440.
	21	Kobayashi et al. "Dielectric Breakdown and Current Conduction of Oxide/Nitride/Oxide Multi-Layer Structures," <i>1990 IEEE Symposium on VLSI Technology</i> . pp. 119-120.
	22	Ma et al. "Fixed and trapped charges at oxide-nitride-oxide heterostructure interfaces formed by remote plasma enhanced chemical vapor deposition," <i>J. Vac. Sci. Technol. B</i> . Vol. 11, No. 4, Jul/Aug 1993, pp. 1533-40.
	23	Dimitrijev et al., "Nitridation of Silicon-Dioxide Films Grown on 6H Silicon Carbide", <i>IEEE Electronic Device Letters</i> , Vol. 18, No. 5, May 05, 1997, pp. 175-177.
	24	De Meo et al., "Thermal Oxidation of SiC in N ₂ O", <i>J. Electrochem. Soc.</i> , Vol. 141, 1994, pp. L150-L152.
	25	Dahlquist et al. "A 2.8kV, Forward Drop JBS Diode with Low Leakage," <i>Materials Science Forum</i> , Vols. 338-342, (2000) pp. 1179-82.
	26	Mondal et al. "An Integrated 500-V Power DSMOSFET/Antiparallel Rectifier Device with Improved Diode Reverse Recovery Characteristics," <i>IEEE Electron Device Letters</i> , Vol. 23, No. 9, September 2002, pp. 562-4.
	27	Motorola Power MOSFET Transistor Databook, 4th edition. Motorola, INC., 1989, pp. 2-5-4 - 2-5-7.
	28	Ryu et al. Article and Presentation: "27 mΩ-cm ² , 1.6 kV Power DiMOSFETs in 4H-SiC," <i>Proceedings of the 14 International Symposium on Power Semiconductor Devices & ICs 2002</i> , June 4-7, 2002, Santa Fe, NM.
▼	29	Chung et al. "Effects of anneals in ammonia on the interface trap density near the band edges in 4H-silicon carbide metal-oxide-semiconductor capacitors," <i>Applied Physics Letters</i> . Vol. 77, Nov. 27, 2000, pp. 3601-3.
LT	30	Williams et al. "Passivation of the 4H-SiC/SiO ₂ Interface with Nitric Oxide," <i>Materials Science Forum</i> . Vols. 389-393 (2002), pp. 967-72.

Examiner: /Long Tran/

Date Considered: 05/05/2006

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FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office		Attorney Docket Number: 5308-279	Serial No.: To Be Assigned
LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)		<u>10/6/08/20</u>	

Applicants: Sei-Hyung Ryu

Filing Date: Concurrently Herewith

Group
Unknown2878

U. S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
<u>WET</u>	1	6,593,620	7/15/03	Hshieh et al.	257	335	
	2	6,455,892	9/02	Okuno	257	77	
	3	6,344,663 B1	2/5/02	Slater, Jr. et al.	257	77	
	4	6,297,172	10/2/01	Kashiwagi	438	773	
	5	6,246,076 B1	6/12/01	Lipkin et al.	257	77	
	6	6,239,463	5/29/01	Williams et al.	257	328	
	7	6,238,967 B1	5/29/01	Shiho et al.	438	244	
	8	6,221,700	4/24/01	Okuno et al.	438	151	
	9	6,211,035	4/01	Moise et al.	438	396	
	10	6,204,203	3/01	Narwanker et al.	438	785	
	11	6,190,973 B1	2/20/01	Berg et al.	438	275	
	12	6,165,822	12/26/00	Okuno et al.	438	142	
	13	6,136,728	10/24/00	Wang			
	14	6,117,735	9/12/00	Ueno	438	268	
	15	6,107,142	8/22/00	Suvorov et al.	438	285	
	16	6,100,169	8/8/00	Suvorov et al.	438	519	
	17	6,096,607	8/1/00	Ueno	438	522	
	18	6,063,698	5/16/00	Tseng et al.			
	19	6,054,352	4/25/00	Ueno	438	268	
	20	6,048,766	4/11/00	Gardner et al.			
	21	6,028,012	2/22/00	Wang			
<u>W</u>	22	6,025,608	2/15/00	Harris et al.	257	77	
<u>WET</u>	23	5,972,801	10/26/99	Lipkin et al.	438	770	
	24	5,972,801	10/26/99	Lipkin et al.	438	770	
<u>WET</u>	25	5,960,289	9/28/99	Tsui et al.	438	257	
<u>WET</u>	26	5,939,763	8/17/99	Hao et al.	257	411	
<u>WET</u>	27	5,885,870A	3/99	Maiti et al.	438	261	

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Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office				Attorney Docket Number: 5308-279		Serial No.: To Be Assigned <u>10/698170</u>
LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)				Applicants: Sei-Hyung Ryu		
				Filing Date: Concurrently Herewith		Group Unknown <u>2878</u>

<u>WT</u>	28	5,837,572	11/17/98	Gardner et al.	438	199
	29	5,763,905	6/9/98	Harris	257	77
	30	5,726,463	3/10/98	Brown et al.	257	77
	31	5,510,630	4/23/96	Agarwal	257	77
	32	5,506,421	4-9-96	Palmour	257	77
	33	5,184,199	2/2/93	Fujii et al.	29	10
	34	5,170,455	12/8/92	Goossen et al.	385	89
	35	5,170,231	12/92	Fujii et al.	257	77
	36	4,875,083	10/17/89	Palmour	357	23.6
	37	4,466,172	8/21/84	Batra	29	571
	38	3,924,024	12/2/75	Naber et al.	427	95
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<u>WT</u>	40	2001/0055852	12/01	Moise et al.	438	396

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		Document Number	Date	Country	Class	Subclass	Translation Yes No
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	42	DE 10036208	2/14/02	Germany			Abstract
	43	DE 198 09 554	9/10/98	Germany			Abstract
	44	DE 19900171	12/26/00	Germany			Abstract
	45	JP 03157974	7/5/91	Japan			Abstract
	46	JP 08264766	10/11/96	Japan			Abstract
	47	JP 09205202	8/5/97	Japan			Abstract
	48	JP 11191559	7/13/99	Japan			Abstract
	49	JP 11238742	8/31/99	Japan			Abstract
	50	JP 11261061	9/24/99	Japan			Abstract
	51	JP 11266017	9/28/99	Japan			Abstract
	52	JP 11274487	10/8/99	Japan			Abstract
↓	53	JP 2000049167	2/18/00	Japan			Abstract
<u>WT</u>	54	JP 2000082812	3/21/00	Japan			Abstract

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LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)					Applicants: Sei-Hyung Ryu		
					Filing Date: Concurrently Herewith		Group <i>Unknown</i> 2828
<i>Wet</i>	55	JP 2000106371	4/11/01	Japan			Abstract
	56	JP0200025246	9/14/00	Japan			Abstract
	57	WO 97/17730	5/15/97	PCT			
<i>Wet</i>	58	WO 97/39485	10/23/97	PCT			
59 OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
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	69	Copy of International Search Report for PCT/US01/30715.					
	70	Copy of International Search Report for PCT/US02/11691 dated 12/4/02.					
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	72	D. Alok, E. Arnold, and R. Egloff, "Process Dependence of Inversion Layer Mobility in 4H-SiC Devices," <i>Materials Science Forum</i> , Vols. 338-342, pp. 1077-1080, 2000.					
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		Filing Date: Concurrently Herewith	Group Unknown <i>28/18</i>
<i>WKT</i>	74	Fukuda et al. "Improvement of SiO ₂ /4H-SiC Interface Using High-Temperature Hydrogen Annealing at Low Pressure and Vacuum Annealing," <i>Jpn J. Appl. Phys.</i> Vol. 38, April 1999, pp. 2306-9	
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LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)		<i>10/698 DPO</i>	
		Applicants: Sei-Hyung Ryu	
		Filing Date: Concurrently Herewith	Group Unknown <i>28/18</i>
<i>Uet</i>	90	M. K. Das, L.A. Lipkin, J.W. Palmour, G.Y. Chung, J.R. Williams, K. McDonald, and L.C. Feldman, "High Mobility 4H-SiC Inversion Mode MOSFETs Using Thermally Grown, NO Annealed SiO ₂ ," <i>IEEE Device Research Conference</i> , Denver, CO June 19-21, 2000.	
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		Applicants: Sei-Hyung Ryu	
		Filing Date: Concurrently Herewith	Group Unknown <i>2818</i>
<i>Ver</i>	106	V.R. Vathulya, H. Shang, and M.H. White, "A Novel 6H-SiC Power DMOSFET with Implanted P-Well Spacer," <i>IEEE Electronic Device Letters</i> , Vol. 20, No. 7, July 1999, pp. 354-356.	
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